

CLAIMS

What is claimed is:

- 5 1. A method for adapting a Bayesian network,  
comprising the steps of:  
determining a set of parameters for the Bayesian  
network;  
updating the parameters for the Bayesian network  
10 in response to a set of observation data using an  
adaptive learning rate.
2. The method of claim 1, wherein the step of  
updating the parameters comprises the steps of:  
15 determining an initial value for the adaptive  
learning rate;  
determining an estimate of the parameters in  
response to the observation data;  
increasing the adaptive learning rate if an  
20 error between the estimate and a mean value of the  
parameters is relatively large.
3. The method of claim 1, wherein the step of  
updating the parameters comprises the steps of:  
25 determining an initial value for the adaptive  
learning rate;  
determining an estimate of the parameters in  
response to the observation data;  
decreasing the learning rate when convergence is  
30 reached between the estimate and a mean value of the  
parameters.

4. The method of claim 1, further comprising the step of obtaining the observation data from an on-line environment.

5 5. The method of claim 1, wherein the step of obtaining comprises the step of obtaining a subset of values in the observation data from an on-line environment.

10 6. A system, comprising:  
on-line environment that generates a set of observation data;  
bayesian network that performs automated reasoning for the on-line environment in response to  
15 the observation data;  
on-line adapter that adapts a set of parameters for the bayesian network in response to the observation data.

20 7. The system of claim 6, wherein the on-line adapter adapts the parameters by determining an initial set of the parameters and then updating the parameters in response to the observation data using an adaptive learning rate.

25 8. The system of claim 7, wherein the on-line adapter updates the parameters by determining an initial value for the adaptive learning rate and determining an estimate of the parameters in response  
30 to the observation data and then increasing the adaptive learning rate if an error between the estimate and a mean value of the parameters is relatively large.

9. The system of claim 7, wherein the on-line adapter updates the parameters by determining an initial value for the adaptive learning rate and determining an estimate of the parameters in response to the observation data and then decreasing the learning rate when convergence is reached between the estimate and a mean value of the parameters.

10. The system of claim 6, wherein the on-line adapter obtains a subset of values in the observation data from an on-line environment.